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*Supplement of*

## **Characterising optical array particle imaging probes: implications for small-ice-crystal observations**

**Sebastian O'Shea et al.**

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$Z_d$	Bullets	Column-aggregates	Columns	Plates	Plate-aggregates	Quasi-spherical	Rosettes	Rosette-aggregates
1	1.2 (0.1)	1.1 (0.1)	1.2 (0.1)	1.1 (0.1)	1.2 (0.0)	1.1 (0.1)	1.2 (0.1)	1.2 (0.0)
2	1.2 (0.1)	1.2 (0.1)	1.2 (0.1)	1.1 (0.1)	1.2 (0.1)	1.2 (0.1)	1.2 (0.1)	1.2 (0.0)
3	1.2 (0.1)	1.2 (0.1)	1.2 (0.1)	1.1 (0.1)	1.2 (0.1)	1.2 (0.1)	1.3 (0.1)	1.2 (0.1)
4	1.1 (0.1)	1.2 (0.1)	1.1 (0.1)	1.2 (0.2)	1.3 (0.1)	1.3 (0.1)	1.3 (0.1)	1.1 (0.1)
5	1.0 (0.1)	1.2 (0.2)	1.1 (0.1)	1.1 (0.3)	1.3 (0.2)	1.3 (0.1)	1.2 (0.2)	1.1 (0.1)
6	1.0 (0.1)	1.0 (0.2)	1.0 (0.1)	0.9 (0.4)	1.1 (0.2)	1.3 (0.1)	1.0 (0.2)	1.0 (0.2)
7	0.9 (0.2)	0.9 (0.2)	0.9 (0.2)	0.6 (0.5)	0.9 (0.3)	1.1 (0.3)	0.7 (0.3)	0.8 (0.2)
8	0.7 (0.2)	0.6 (0.3)	0.7 (0.3)	0.1 (0.3)	0.5 (0.3)	0.6 (0.4)	0.2 (0.4)	0.5 (0.3)
9	0.4 (0.3)	0.2 (0.3)	0.4 (0.4)	0.0 (0.0)	0.0 (0.2)	0.2 (0.3)	0.0 (0.1)	0.1 (0.3)

*Table S1. Median (inter-quartile range)  $D/D_0$  at selected  $Z_d$  for different habits using the circle equivalent diameter.*

$Z_d$	Bullets	Column-aggregates	Columns	Plates	Plate-aggregates	Quasi-spherical	Rosettes	Rosette-aggregates
1	1.1 (0.1)	1.1 (0.1)	1.2 (0.1)	1.1 (0.1)	1.2 (0.1)	1.2 (0.1)	1.1 (0.2)	1.1 (0.1)

2	1.2 (0.2)	1.2 (0.1)	1.2 (0.1)	1.1 (0.2)	1.2 (0.1)	1.3 (0.1)	1.1 (0.1)	1.1 (0.1)
3	1.2 (0.2)	1.2 (0.1)	1.2 (0.2)	1.2 (0.2)	1.3 (0.1)	1.4 (0.1)	1.2 (0.2)	1.1 (0.2)
4	1.3 (0.2)	1.3 (0.2)	1.3 (0.2)	1.3 (0.5)	1.4 (0.2)	1.5 (0.1)	1.2 (1.2)	1.1 (0.4)
5	1.3 (0.5)	1.3 (0.8)	1.4 (0.2)	1.3 (1.5)	1.5 (0.3)	1.6 (0.1)	0.0 (1.1)	0.4 (1.2)
6	0.9 (1.4)	0.7 (1.4)	1.3 (1.3)	0.7 (1.6)	1.3 (1.6)	1.7 (0.2)	0.0 (0.0)	0.0 (0.6)
7	0.0 (0.7)	0.0 (0.5)	0.3 (1.4)	0.0 (1.1)	0.0 (1.3)	1.6 (0.7)	0.0 (0.0)	0.0 (0.0)
8	0.0 (0.0)	0.0 (0.0)	0.0 (0.7)	0.0 (0.3)	0.0 (0.3)	1.0 (1.3)	0.0 (0.0)	0.0 (0.0)
9	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.4 (0.9)	0.0 (0.0)	0.0 (0.0)

*Table S2. Same as Table S1 but using the mean X-Y diameter.*

Z <sub>d</sub>	Bullets	Column- aggregates	Columns	Plates	Plate- aggregates	Quasi- spherical	Rosettes	Rosette- aggregates
1	1.0 (0.1)	1.0 (0.1)	1.0 (0.2)	1.1 (0.2)	1.1 (0.1)	1.2 (0.1)	1.1 (0.1)	1.0 (0.2)
2	1.5 (0.2)	1.3 (0.1)	1.4 (0.2)	1.1 (0.2)	1.2 (0.1)	1.3 (0.1)	1.2 (0.1)	1.3 (0.2)
3	1.3 (1.9)	1.6 (0.4)	1.8 (1.3)	1.4 (0.2)	1.5 (0.2)	1.5 (0.1)	1.5 (0.2)	1.6 (1.0)

4	0.0 (0.3)	1.6 (2.0)	0.0 (2.0)	1.6 (1.6)	1.8 (0.4)	1.8 (0.1)	1.3 (1.9)	0.0 (1.8)
5	0.0 (0.0)	0.0 (1.3)	0.0 (0.3)	1.1 (1.9)	1.7 (2.2)	2.0 (0.1)	0.0 (1.0)	0.0 (0.3)
6	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (1.1)	0.0 (1.3)	2.1 (1.2)	0.0 (0.0)	0.0 (0.0)
7	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (2.2)	0.0 (0.0)	0.0 (0.0)
8	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.7)	0.0 (0.0)	0.0 (0.0)
9	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)

*Table S3. Same as Table S1 but using the maximum diameter.*